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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,508	11/10/2001	John C. Tsai	60154.302001	3381

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INTELLECTUAL PROPERTY LAW OFFICE
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EXAMINER

LYONS, MICHAEL A

ART UNIT PAPER NUMBER

2877

DATE MAILED: 11/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/053,508

Applicant(s)

TSAI, JOHN C.

Examiner

Michael A. Lyons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Response to Arguments***

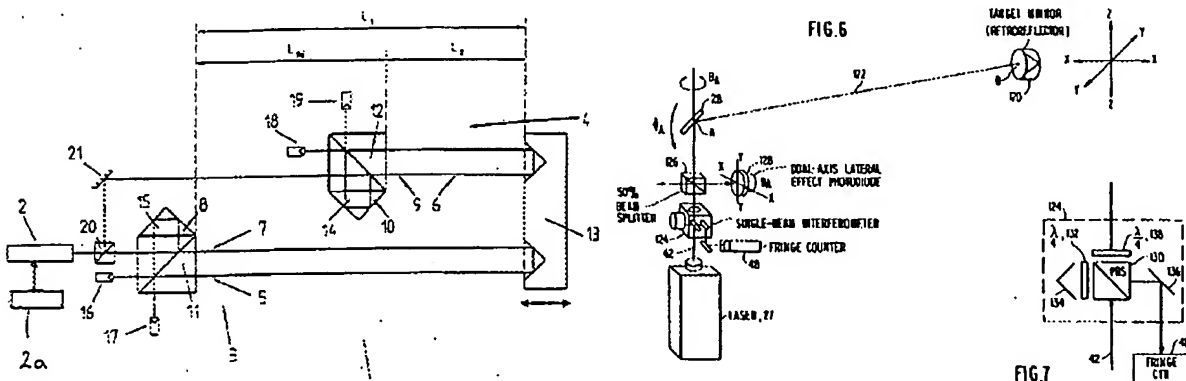
Applicant's arguments, see applicant's pre-brief conference request, filed August 8, 2005, with respect to the rejection(s) of claim(s) 1-20 under Lau et al in view of Thiel et al have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of the art as applied below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thiel et al (5,521,704) in view of Lau et al (4,714,339).



Regarding claims 1, 12, and 17, Thiel (Fig. 1) discloses a measuring apparatus and corresponding method with a light source 2 for producing light for two optical channels 3 and 4,

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each optical channel including, for example from channel 3, a beam splitter 11 that receives a light beam and produces a measurement beam 7 and a reference beam 8, a reflective target 13 for receiving and redirecting the measurement beam, the beam splitter then receiving the measurement beam and providing a first portion and a second portion, each of these beams going to detectors 16 and 17, the beam splitter, retroreflector 15, and target 13 all acting as an interferometer.

Thiel, however, fails to disclose an explicit interferometer for generating the reference and measurement beams, this interferometer also taking the second portion from the beam splitter and combining it with the reference beam to form a result beam.

Lau (Fig. 6 and 7) discloses a measuring apparatus and corresponding method comprising laser 27 as a light source, and an optical channel including an interferometer 124, a target mirror 120, a beam splitter 126, a detector 128 for detecting a first portion generated by the beam splitter, with the interferometer receiving a second portion from the beam splitter that is combined with a reference beam generated in the beam splitter, and a fringe counter 48 as a receiver for the combined beam from the interferometer.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add the explicit interferometer to each optical channel of the device of Thiel as per Lau, the motivation for this and the dependent claims being that the addition of the explicit interferometer will allow for easy detection of a stand-alone measurement and an interfered measurement/reference beam so that multiple, distinct measurements can be more easily obtained than by the detection of a pair of interfered beams as currently disclosed by Thiel.

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As for claim 2, Thiel discloses laser 2.

As for claims 3 and 13, Thiel discloses the use of a beam splitter 20 and a bending mirror 21 to produce a light beam for the second optical channel.

As for claim 4, the combination of Lau and Thiel only discloses a single light source. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a second light source to the device for the second channel, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

As for claims 5, 14, and 18, see Fig. 7 of Lau. Additionally, Fig. 3 of Lau shows that the beam splitter outside of the interferometer can be a polarizing beam splitter in conjunction with a quarter wave plate.

As for claim 6, target 120 of Lau and target 13 of Thiel are retroreflectors.

As for claims 7-8, detector 128 of Lau is a “dual-axis lateral effect photodiode” (Col. 8, line 65) and therefore is position sensitive.

As for claim 9, while counter 48 is not explicitly disclosed to be a photodiode, it would have been obvious to one of ordinary skill to make the counter a photodiode, as Official Notice is taken as to the well known use of photodiodes for fringe measurement and detection in an interferometer.

As for claims 10 and 15, Lau discloses computer 30.

As for claims 11, 16, and 19-20, the light source of Thiel is tunable, and therefore able to be modulated to produce a light beam with a modulation characteristic. Additionally, although the computer of Lau fails to explicitly disclose a phase sensitive detection, or a demodulator for

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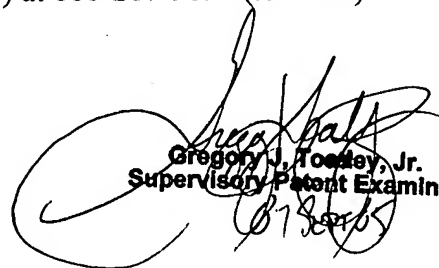
demodulating a modulated signal, it would have been obvious to one of ordinary skill to make detection phase sensitive, as Official Notice is taken as to making demodulated measurements of a modulated signal and phase related measurements in interferometry, the motivation being that making a measurement on a demodulated signal produces a more accurate result, as any modification to the signal caused by the modulated beam has been removed, leaving a cleaner signal for measurement.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 571-272-2420. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAL
September 7, 2005


Gregory J. Toatley, Jr.
Supervisory Patent Examiner